

### ABSTRACT

Featured is a device for detecting electromagnetic signals, more specifically, the magnetic resonance signals from excited nuclei as well as related apparatuses, systems and methods. The detection device includes a planar strip array antenna including a plurality, and in more particular embodiments a multiplicity of parallel conductors (e.g., 4, 16, 32 or more of conductors). The length of the conductors is adjusted to substantially reduce the coupling of a signal in one conductor to an adjacent conductor(s). In a more specific embodiment the length is set so as to be equal to be about  $n\lambda/4$ , where  $n$  is an integer  $\geq 1$  and  $\lambda$  is the wavelength of the signal to be detected (e.g., the wavelength corresponding to the NMR resonance frequency for the nuclei). The device also is configured so that the electromagnetic wave on each conductor is one of a standing wave or a traveling wave. Additionally, the device is configurable to provide broad band de-coupling by controlling a ratio of the spacing between conductors and the height of an encapsulation member so as to be less than or equal to a given value. Such a device can further include an EMF interference guard so as to isolate at least a portion of the conductors.